(12) **United States Patent**
Patel

(10) **Patent No.:** US 11,074,580 B2
(45) **Date of Patent:** Jul. 27, 2021

(54) **DEVICE AND METHOD FOR PROVIDING EXTERNAL ACCESS TO MULTI-DROP BUS PERIPHERAL DEVICES**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **16/934,933**

(22) Filed: **Jul. 21, 2020**

(65) **Prior Publication Data**

US 2020/0349571 A1   Nov. 5, 2020

Related U.S. Application Data

(63) Continuation-in-part of application No. 15/406,492, filed on Jan. 13, 2017, now Pat. No. 10,719,833.
(Continued)

(51) **Int. Cl.**
G06Q 20/40 (2012.01)
G06Q 20/32 (2012.01)
(Continued)

(52) **U.S. Cl.**
CPC *G06Q 20/40* (2013.01); *G06F 13/00* (2013.01); *G06Q 20/18* (2013.01); *G06Q 20/32* (2013.01); *G06Q 20/322* (2013.01); *G06Q 20/327* (2013.01); *G06Q 20/3226* (2013.01); *G06Q 20/3278* (2013.01); *G06Q 20/36* (2013.01); *G06Q 20/38* (2013.01);
(Continued)

(58) **Field of Classification Search**
CPC G06Q 20/40; G06Q 20/18; G06Q 20/32; G06Q 20/322; G06Q 20/3226; G06Q 20/327; G06Q 20/3278; G06Q 20/36; G06Q 20/38; G06Q 20/3821; G06Q 20/3823; G06Q 20/3829; G06Q 20/401; G06Q 20/405; G06F 13/00
USPC 710/8
See application file for complete search history.

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(57) **ABSTRACT**

A method and device for retrofitting a machine controller to accommodate one or more electronic peripheral devices is disclosed herein. A device with processor(s), memory, a slave interface, and host interface(s) performs as a virtual peripheral by registering itself as a slave to the machine controller coupled with the slave interface and performs as a virtual machine controller by registering peripheral(s) coupled with the host interface(s) as slaves to the device. The device receives a command from the machine controller via the slave interface and, in response to receiving the command: sends an acknowledgement to the machine controller via the slave interface; and relays the command to a respective peripheral via a respective one of the host interface(s), where the device sends signals to and from the machine controller asynchronous of sending signals to and from the peripheral(s).

17 Claims, 44 Drawing Sheets
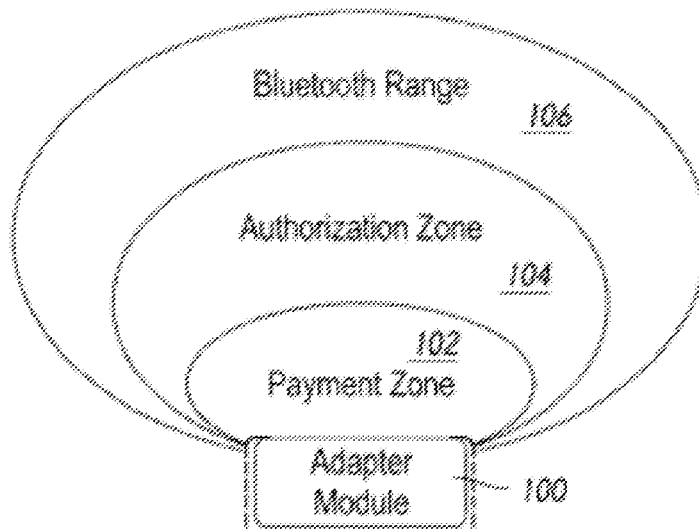
Related U.S. Application Data

which is a continuation of application No. 14/335, 762, filed on Jul. 18, 2014, now Pat. No. 9,547,859, which is a continuation of application No. 14/214, 644, filed on Mar. 14, 2014, now Pat. No. 8,856,045, which is a continuation-in-part of application No. 29/477,025, filed on Dec. 18, 2013, now Pat. No. Des. 755,183, application No. 16/934,933, which is a continuation-in-part of application No. 16/029,483, filed on Jul. 6, 2018, now Pat. No. 10,963,905, which is a continuation of application No. 14/611,065, filed on Jan. 30, 2015, now Pat. No. 10,019,724, application No. 16/934,933, which is a continuation-in-part of application No. 15/893,514, filed on Feb. 9, 2018, which is a continuation of application No. PCT/US2017/015676, filed on Jan. 30, 2017, said application No. 15/893,514 is a continuation-in-part of application No. 14/641,236, filed on Mar. 6, 2015, now abandoned, which is a continuation-in-part of application No. 14/320,534, filed on Jun. 30, 2014, now abandoned, which is a continuation-in-part of application No. 14/214,644, filed on Mar. 14, 2014, now Pat. No. 8,856,045, which is a continuation-in-part of application No. 29/477,025, filed on Dec. 18, 2013, now Pat. No. Des. 755,183.

(60) Provisional application No. 61/917,936, filed on Dec. 18, 2013, provisional application No. 62/289,158, filed on Jan. 29, 2016, provisional application No. 62/081,492, filed on Nov. 18, 2014.

(51) **Int. Cl.**

G06Q 20/38	(2012.01)
G06Q 20/36	(2012.01)
G06Q 30/06	(2012.01)
G07F 9/02	(2006.01)
G07F 9/00	(2006.01)
G06Q 20/18	(2012.01)
G06F 13/00	(2006.01)

(52) **U.S. Cl.**
CPC *G06Q 20/3821* (2013.01); *G06Q 20/3823* (2013.01); *G06Q 20/3829* (2013.01); *G06Q 20/401* (2013.01); *G06Q 20/405* (2013.01); *G06Q 30/06* (2013.01); *G07F 9/002* (2020.05); *G07F 9/023* (2013.01); *G06Q 2220/00* (2013.01)

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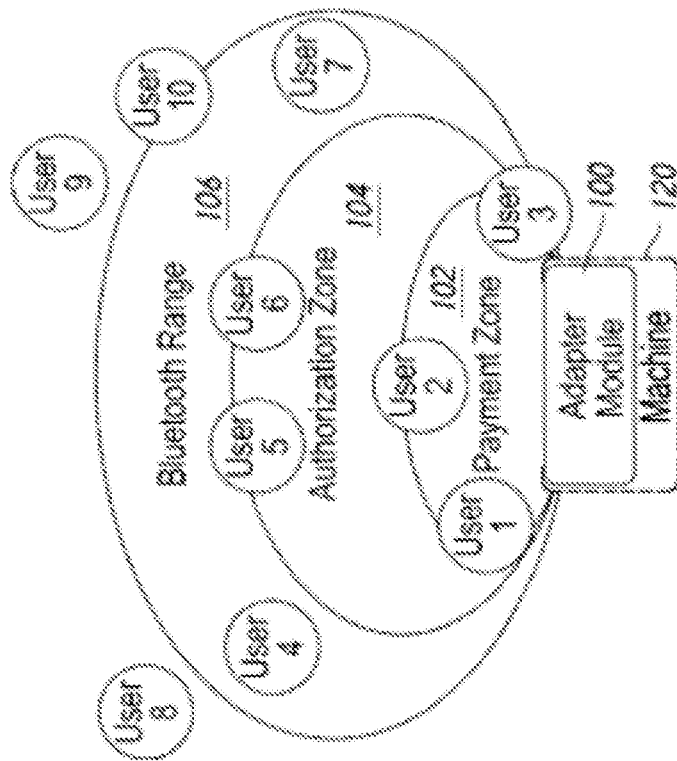
Figure 2
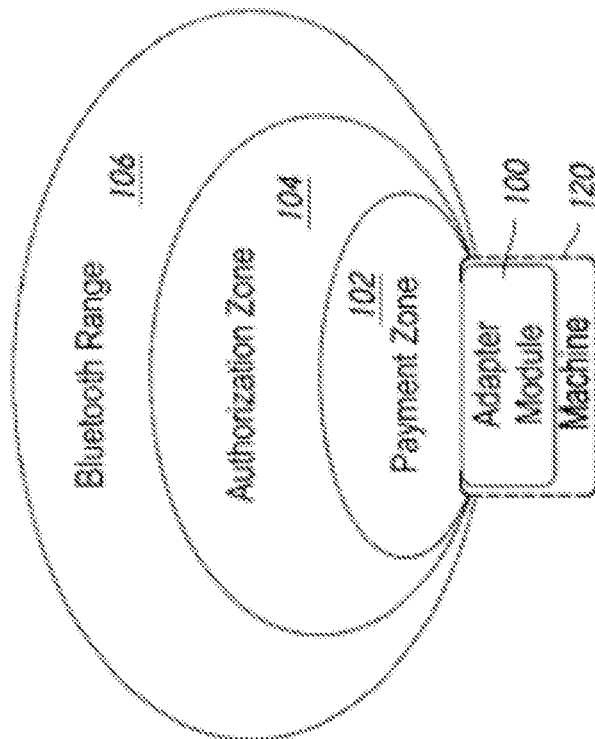
Figure 1

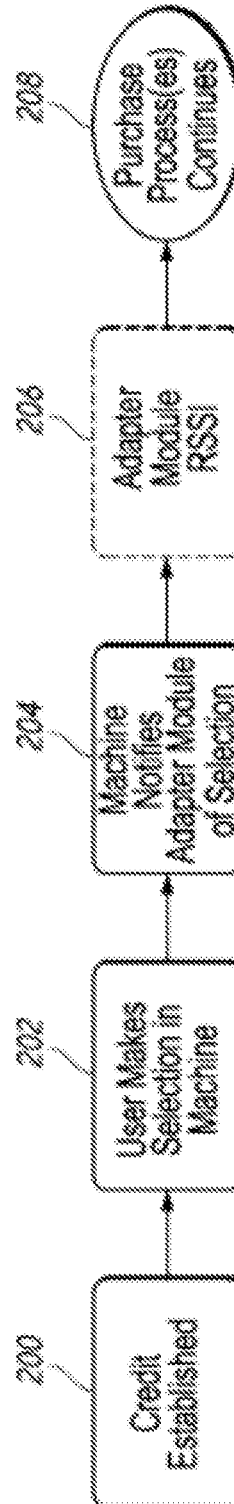| Tab	Favorite?	Alert	View to User
All	Yes	No	User can make Hands-free Credit with the connected vending machine
All	No	Yes	User needs to launch Mobile Device and then swipe to make transaction manually
Favorite	Yes	No	Hands-free transaction will be available to the user via vending machine
Favorite	No	No	User is not alerted for the vending machine which is not a favorite machine. Hands-free mode will not work, manual swipe for transaction required by user
Either All or Favorite	Yes	Yes	BUT Hands-free Credit is not available (disabled by module, expired AuthGrant, insufficient balance, or other issue), then user will get an alert so that user can swipe credit manually.

Figure 3

Credit Established _200_ → User Makes Selection in Machine _202_ → Machine Notifies Adapter Module of Selection _204_ → Adapter Module RSSI _206_ → Purchase Process(es) Continues _208_
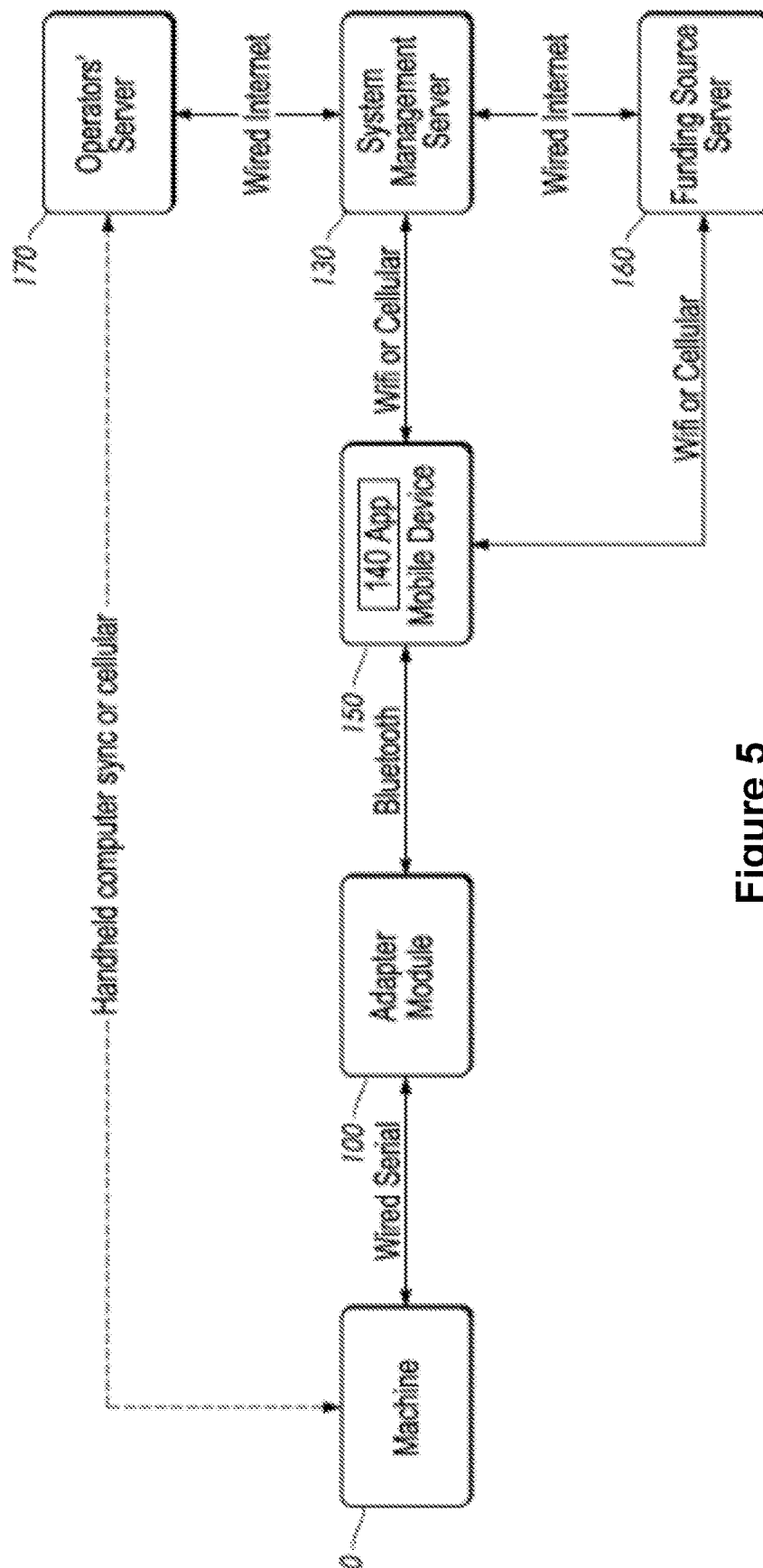
Figure 4

Figure 5

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